

Translation of the relevant paragraphs of DE 100 48 375 A1

[0002] The term "biochip" is understood to mean a product for the rapid detection and quantitative and/or qualitative determination of small amounts of one or more biological substances. Such biochips are used predominantly in basic research, in environmental and food technology, in the pharmaceutical and medical sector and in high throughput screening.

[0014] The task of the present invention is therefore to provide a biochip and also a multifunctional and multiparametric biochip arrangement, which can be used intracorporeally and is able to provide analysis data online.

[0016] A biochip is provided which comprises a sensor unit for measuring the components of body fluids or cell cultures, in particular for measuring the components of capillary, venous and arterial blood, wherein the biochip is provided with a micropump, a controller chip and a transmitting and receiving unit and the sensor unit comprises at least one sensor element and a reference system for continuous comparison with the sensor element.

[0017] Here, the sensor element may be arranged in the pump chamber or else in a device of the pump which leads away from the pump chamber. The sensor element is preferably arranged in such a way that it can be continuously supplied with fluid pumped to it.

[0020] It is provided that the biochip is introduced subcutaneously into the body. It can be used to measure in particular the capillary, venous and arterial blood, although measurements of all other body fluids are also possible.

[0027] Also provided is a modular arrangement for measuring the components of body fluids or cell cultures and for regulating an organism, consisting of a plurality of individual elements, which are combined according to the requirements, wherein the modular arrangement consists of a biochip as described above, at least one controlling system for electronic control, rechargeable batteries, a transmitting

system, a receiving system and at least one unit consisting of a supply container and a micropump for dispensing substances.

[0028] The modular arrangement and in particular the biochip according to the invention should be designed in such a way that they can be introduced intracorporeally into the body of a patient or animal. Here, they are provided for the online measurement of the components in body fluids. These components may be proteins, peptides, RNA, DNA (external DNA), viruses, bacteria, but also low-molecular-weight substances such as glucose. The pH, temperature and pressure may also be measured.

[0029] The controlling system here preferably consists of a microchip (ASIC) and a transmitting and receiving unit, wherein the individual elements are preferably coupled back to one another.

[0034] In addition to the elements already described, there is preferably provided a main receiving part for receiving the signals from the individual transmitters on the elements. The main receiving part preferably has devices for processing the received signals, for displaying them graphically and for further processing them.

[0036] A radio system is preferably used for communication between the individual elements, wherein communication between the individual elements also preferably takes place via encrypted protocols. The radio system can be configured according to requirements and according to Bluetooth® protocols. As an alternative, other radio transmission protocols can be used.

[0038] This modular arrangement allows a continuous measurement over a long period of time. The elements of the arrangement can be inserted in vivo for several years, without having to be replaced.

[0039] It is thus possible to carry out continuous monitoring of the general condition and optionally regulation by dispensing suitable substances from the supply container.

[0044] Each element may comprise internal monitoring of its internal state. The element monitors itself. Checking of the internal state of the element is thus possible at any

time. A shift in sensitivity of the biochip can also be recorded and communicated to the internal element when dispensing substances by being coupled back.